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10/501,700	07/16/2004	Tobias Schneider	03869.105859	5094

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EXAMINER	
SAINT CYR, LEONARD	

ART UNIT	PAPER NUMBER
2626	

NOTIFICATION DATE	DELIVERY MODE
11/15/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/501,700	SCHNEIDER, TOBIAS	
	Examiner	Art Unit	
	LEONARD SAINT CYR	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *12 - 29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *12-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07/16/04* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 08/31/10 have been fully considered but they are not persuasive.

Applicant argues that neither D'hoore nor Riis nor Fabiani teach or suggest for each of the plurality of words, applying the phoneme map to each of the N first phoneme sequences for that word in order to translate the N first phoneme sequences in N second phoneme sequences, each of the N second phoneme sequences formed from phonemes associated with the mother tongue language (Amendment, pages 7 – 10).

The examiner disagrees, since Fabiani et al., disclose that "all the vocabulary items in the sub-set are further associated to transcriptions belonging to a common default language. Preferably, **the sub-transcription units of the transcriptions from languages in the first sub-group of languages are mapped onto sub-transcription units of the default language**…the sub-transcription unit(s) that does not have a speech model available in the collection of reference sub-transcription units is processed **to derive a substitute sub-transcription unit from the collection of reference sub-transcription units that is acoustically similar to the sub-transcription unit(s)** that does not have a speech model available. The sub-transcription unit(s) that does not have a speech model available is then replaced in the transcription by the substitute sub-transcription unit(s). The modified transcription

is then released. In the specific example where the sub-transcription units are phonemes, a nearest phoneme method is used for the substitution process. The nearest phoneme method is described in detail below in particular with reference to block 708 of FIG. 7. In its broad aspect, a nearest phoneme method maps phoneme A to a phoneme B that is acoustically similar to phoneme A residing in a collection of phonemes" (sub-transcriptions units in the first sub-groups of languages, which are phonemes that do not have specific models in the reference collection **represent the plurality of words**, wherein the collection of reference sub-transcriptions **represent phonemes of the mother-tongue (default) language**; paragraphs 33, 50, and 63; see also example of paragraph 71).

Applicant argues that neither D'hoore nor Riis nor Fabiani teach or suggest for each word, two different phonetic transcripts are generated for each of the N different languages, including the N first phoneme sequences for the word, each formed from phoneme associated with one of the N different languages and the N second phoneme sequences for the word, each formed by applying the phoneme map to translate one of the N first phoneme sequences formed from phonemes associated with one of the N different languages into a sequence of phonemes associated with the mother tongue language (Amendment, pages 7 – 10).

The examiner disagrees, since Fabiani et al., disclose that "all the vocabulary items in the sub-set are further associated to transcriptions belonging to a common default language. Preferably, **the sub-transcription units of the transcriptions from**

languages in the first sub-group of languages (N first phoneme sequences for the word) **are mapped onto sub-transcription units of the default language (**N second phoneme sequences for the word)…the sub-transcription unit(s) that does not have a speech model available in the collection of reference sub-transcription units is processed **to derive a substitute sub-transcription unit from the collection of reference sub-transcription units that is acoustically similar to the sub-transcription unit(s)** that does not have a speech model available. The sub-transcription unit(s) that does not have a speech model available is then replaced in the transcription by the substitute sub-transcription unit(s). The modified transcription is then released. In the specific example where the sub-transcription units are phonemes, a nearest phoneme method is used for the substitution process. The nearest phoneme method is described in detail below in particular with reference to block 708 of FIG. 7. In its broad aspect, a nearest phoneme method maps phoneme A to a phoneme B that is acoustically similar to phoneme A residing in a collection of phonemes" (sub-transcriptions units in the first sub-groups of languages **represent the N first phoneme sequences for the word**, and ; paragraphs 33, 50, and 63; see also example of paragraph 71).

Applicant argues that claims 22 - 29 are statutory since recite now an automatic language recognizing apparatus, including computer program modules encoded in tangible computer readable media (Amendment, page 6).

The examiner disagrees, since computer readable medium is not defined in the specification as non-transitory medium. Thus, the 101 rejection, regarding claims 22 – 29 is maintained.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 22 – 29 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Although Claims 22 – 29 appear to fall within a statutory category *(i.e., apparatus)*, Claims 22 – 29 encompass nothing more than logic/software modules as per the specification *("*The determination of the phonetic transcripts in the first step of the method takes place preferably by means of at least one neural network. Neural networks have proved suitable for determining phonetic transcripts from written words, because they produce good results with regards to accuracy, and particularly with regard to the speed of processing and can be easily implemented, particularly in 10 software*", Page 9, lines 5 - 10)*. Thus, Claims 22 – 29 are directed to non-statutory subject matter because their scope includes a computer program embodiment, an abstract data structure which does not fall within one of the four statutory categories *(i.e., it is directed to a program per se)*. See also MPEP § 2106.IV.B.1.a. Data structures not claimed as embodied in computer readable media are descriptive material *per se*

and are not statutory because they are not capable of causing functional change in the computer. See, e.g., *Warmerdam*, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure *per se* held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention, which permit the data structure's functionality to be realized. In contrast, a claimed computer readable medium encoded with a data structure defines structural and functional interrelationships between the data structure and the computer software and hardware components which permit the data structure's functionality to be realized, and is thus statutory. Similarly, computer programs claimed as computer listings *per se*, i.e., the descriptions or expressions of the programs are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized.

Claims 22 – 29 are directed to a computer readable medium storing processor executable instructions that is not limited to a non-transitory, and thus, statutory medium. The scope of "computer-readable medium" is not defined in the specification may include signal-based mediums such as "signals used to propagate instructions", "carrier waves/pulses", since the specification discloses “The phoneme sequence determination and the succeeding mapping or depiction normally run offline on a device,

for example a mobile telephone, a personal digital assistant or personal computer with corresponding software, and are therefore time uncritical. The resources required for this can be held in an internal/external memory"; *(see Specification, Page 8, lines 1 - 7)*. A signal does not fall within one of the four statutory categories of invention *(i.e., process, machine, manufacture, or composition of matter)* because it is an ephemeral, transient signal and thus is non-statutory. Since the scope of "computer-readable medium" includes these non-statutory instances, claims 22 – 29 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. Claims 12, 13, 20, 21, 22, 28, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'hoore et al., (US Patent 6,085,160) in view of Riis et al., (US PAP 2003/0050779); and further in view of Fabiani et al., (US PAP 2002/0173945).

As per claims 12, and 22, D'hoore et al., teach a method/apparatus for automated language recognition of words from different languages said method embodied as computer program instructions encoded in tangible computer readable media comprising the steps of:

(a) loading a phoneme set associated with a language specified as a mother tongue into a mother tongue language recognizer ("subword units in a first language"; col.2, lines 7 – 14);

(b) for each of a plurality of words, determining phonetic transcripts for the word for N various languages not specified as the mother tongue to generate N first phoneme sequences for the word corresponding to N first pronunciation variants, each of the N first phoneme sequences formed from phonemes associated with one of the N different languages ("generate several phonetic transcriptions"; col.8, lines 13 – 15);

However, D'hoore et al., do not specifically teach determining a phoneme map by mapping the generated first phoneme sequences of each of said N languages to a relevant phoneme set of the mother tongue; for each of the plurality of words, applying the phoneme map to each of the N first phoneme sequences for that word in order to translate the N first phoneme sequences in N second phoneme sequences, each of the N second phoneme sequences formed from phonemes associated with the mother tongue language; such that for each word, two different phonetic transcripts are generated for each of the N different languages, including the N first phoneme sequences for the word, each formed from phoneme associated with one of the N different languages and the N second phoneme sequences for the word, each formed by applying the phoneme map to translate one of the N first phoneme sequences formed from phonemes associated with one of the N different languages into a sequence of phonemes associated with the mother tongue language; processing said N second phoneme sequences with the phoneme set associated with the language specified as the mother tongue to identify at least one of a matching word and a similar word.

Fabiani et al., disclose that the all the vocabulary items in the sub-set are further associated to transcriptions belonging to a common default language. Preferably, **the sub-transcription units of the transcriptions from languages in the first sub-group of languages are mapped onto sub-transcription units of the default language**…the sub-transcription unit(s) that does not have a speech model available in the collection of reference sub-transcription units is processed **to derive a substitute sub-transcription unit from the collection of reference sub-transcription units that is acoustically similar to the sub-transcription unit(s)** that does not have a speech model available. The sub-transcription unit(s) that does not have a speech model available is then replaced in the transcription by the substitute sub-transcription unit(s). The modified transcription is then released. In the specific example where the sub-transcription units are phonemes, a nearest phoneme method is used for the substitution process. The nearest phoneme method is described in detail below in particular with reference to block 708 of FIG. 7. In its broad aspect, a nearest phoneme method maps phoneme A to a phoneme B that is acoustically similar to phoneme A residing in a collection of phonemes (sub-transcriptions units in the first sub-groups of languages, which are phonemes that do not have specific models in the reference collection **represent the plurality of words**, wherein the collection of reference sub-transcriptions **represent phonemes of the mother-tongue (default) language**; paragraphs 33, 50, and 63; see also example of paragraph 71).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use phonemes mappings as taught by Fabiani et al., in

D'hoore et al., because that would help generate suitable pronunciations of vocabulary items (Fabiani et al., paragraph 1).

However, D'hoore et al., in view of Fabiani et al., do not specifically teach processing said N second phoneme sequences with the phoneme set associated with the language specified as the mother tongue to identify at least one of a matching word and a similar word.

Riis et al., teach capturing both inter- and intra-language pronunciation variations which is ideal for multilingual speaker independent speech recognition systems; generating pronunciations in response to said sequences of multilingual phoneme symbols, and comparing said pronunciations with the acoustic input in order to find a match (Abstract, lines 7 – 10; paragraph 15, lines 8 – 11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to generate inter- and intra-language pronunciation variations as taught by Riis et al., in D'hoore et al., in view of Fabiani et al., because that would help improve recognition performance (paragraph 67).

As per claim 13, D'hoore in view of Riis et al., further in view of Fabiani et al., further disclose adding the N second phoneme sequences for each word in a language recognition vocabulary located in the mother tongue language recognizer (Riis et al.,"generating a sequences of multilingual phoneme symbols"; paragraph 15).

As per claims 20, 21, 28, and 29, D'hoore in view of Riis et al., further in view of Fabiani et al., further disclose determining the phonetic transcripts of each word for N various languages not specified as the mother tongue is performed by at least one neural network; processing said N second phoneme sequences with the phoneme set associated with the language specified as a mother tongue is performed using a Hidden Markov Model (Riis et al.,"The acoustic phoneme models where based on a HMM/NN hybrid known as Hidden Neural Networks (HNN)'; paragraph 53, lines 1 – 3).

5. Claims 14 – 16, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'hoore et al., (US Patent 6,085,160) in view of Riis et al., (US PAP 2003/0050779), further in view of Fabiani et al., (US PAP 2002/0173945), and further in view of Bub et al., (US Patent 6,460,017).

As per claims 14, and 23, D'hoore et al., in view of Riis et al., further in Fabiani et al., do not specifically teach determining distances to the N second pronunciation variants based at least on the processed N second phoneme sequences

Bub et al., teach measuring the distance or determining the similarity of two phonemes models of the same sound from different languages (col.11, lines 45 – 48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to measure the distance between phonemes as taught by Bub et al., in D'hoore et al., in view of Riis et al., further in Fabiani et al., because that would help improve recognition performance (Riis et al., paragraph 67).

As per claim 15, Riis et al., further disclose classifying each N second phoneme sequences ("inter- and intra-language pronunciation variations"; Abstract, lines 7 – 10).

However, D'hoore et al., in view of Riis et al., further in view of Fabiani et al., do not specifically teach identifying respective distances.

Bub et al., teach measuring the distance or determining the similarity of two phonemes models of the same sound from different languages (col.11, lines 45 – 48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to measure the distance between phonemes as taught by Bub et al., in D'hoore et al., in view of Riis et al., further in view of Fabiani et al., because that would help improve recognition performance (Riis et al., paragraph 67).

As per claim 16, Bub et al., further disclose eliminating any N second phoneme sequences that do not meet or exceed a predetermined threshold ("distance threshold"; col.12, lines 51, and 52).

6. Claims 17, 24, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'hoore et al., (US Patent 6,085,160) in view of Riis et al., (US PAP 2003/0050779), further in view of Fabiani et al., (US PAP 2002/0173945), further in view of Bub et al., (US Patent 6,460,017), and further in view of Brill et al., (US Patent 7,047,493).

As per claims 17, 24, D'hoore et al., in view of Riis et al., further in view of Fabiani et al., and further in view of Bub et al., do not specifically teach that the distances are Levenshtein distances.

Brill et al., teach using Levenshtein distance (col.3, line 31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use Levenshtein distance as taught by Brill et al., in D'hoore et al., in view of Riis et al., further in view of Fabiani et al., and further in view of Bub et al., because that would help improve recognition performance (Riis et al., paragraph 67).

As per claim 25, Bub et al., further disclose eliminating any N second phoneme sequences that do not meet or exceed a predetermined threshold ("distance threshold"; col.12, lines 51, and 52).

7. Claims 18, 19, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over D'hoore et al., (US Patent 6,085,160) in view of Riis et al., (US PAP 2003/0050779), further in view of Fabiani et al., (US PAP 2002/0173945), and further in view of Harengel et al., (US PAP 2004/0039570).

As per claims 18, 19, 26, and 27, D'hoore et al., in view of Riis et al., further in view of Fabiani et al., do not specifically teach determining the probabilities that each word for N various languages not specified as the mother tongue belong to a specified set of languages, said step of determining probabilities occurring before step (a); and

eliminating languages from said specified set that do not exceed a predetermined threshold.

Harengel et al., teach if the probability coefficient for the assignment of a word to at least one language exceeds the threshold value, the grapheme-phoneme assignment which corresponds to the respective word is supplemented in the pronunciation lexicon (paragraph 10, lines 8 – 13).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to determine a probability coefficient of a word as taught by Harengel et al., in D'hoore et al., in view of Riis et al., further in view of Fabiani et al., because that would help improve recognition performance (Riis et al., paragraph 67).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEONARD SAINT CYR whose telephone number is (571) 272-4247. The examiner can normally be reached on Mon- Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or (571)-272-1000.

LS
11/07/10
/Leonard Saint-Cyr/
Examiner, Art Unit 2626